

CITY OF HELENA

Slips, Trips, and Falls



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This course will introduce you to the hazards of slips, trips, and falls. We will also discuss ways to avoid these hazards! What is wrong with this picture? What's right with it?

What this presentation covers

- The costs of slip, trip, and fall events
- Definitions
- Causes of slips and trips
- Factors increasing the risk of slips and trips:
 - Work environment
 - Human factors



Slips, Trips, and Falls Are Costly

Slips and trips can happen in any part of the workplace, inside or outdoors. Slips and trips often result in falls and more serious outcomes, including disabling injuries and even death. The costs to both worker and employer can be great.

To Worker:



- pain
- lost wages
- temporary or permanent disability
- reduced quality of life
- depression

To Employer:



- loss in productivity and business
- increased industrial insurance premiums
- costs associated with training replacement worker

Slip, Trip, and Fall Incidents Occur Frequently

According to the U. S. Department of Labor, slips, trips, and falls make up the majority of general industry accidents.

- 15 percent of all accidental deaths ($\approx 12,000$ /year), second leading cause behind motor vehicles
- one of the most frequent types of reported injuries – about 25% of reported claims per fiscal year
- over 17% of all disabling work injuries are the result of falls



**MANY OF THESE COULD
HAVE BEEN PREVENTED**

Injuries from Slips, Trips, and Falls

Common types of injuries:

- Sprains, strains
- Bruises, contusions
- Fractures
- Abrasions, lacerations



Commonly affected body parts:

- Knee, Ankle, Foot
- Wrist, Elbow
- Back
- Shoulder
- Hip
- Head

Slips and Trips Can Initiate a Cascade Of Events Resulting in More Serious Injuries or Death

The following is a fatality case from the National Institute for Occupational Safety and Health (NIOSH) [Fatality Assessment and Control Evaluation \(FACE\) Program](#).

Apprentice Lineman Electrocuted While Setting Utility Pole



A 34-year-old male apprentice lineman (the victim) was electrocuted while assisting a co-worker in setting a wooden utility pole. The pole had been raised between two phases of a 34,500-volt overhead power-line and the victim was helping set the pole by steadying the butt over the hole. The victim *slipped on the wet ground* and his unprotected upper body fell against the pole while the top of the pole contacted one phase of the powerline (19,900-volt phase to ground). The victim was wearing rubber lineman's gloves as required by company policy. The wet connections allowed the current to travel down the pole, entering the victim's chest and exiting to ground through the victim's right elbow. The victim raised up, stepped back from the pole, and collapsed to the ground. Cardiopulmonary resuscitation was initiated immediately by the co-worker and a passing emergency medical technician; however, efforts to revive the victim were unsuccessful.

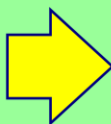
Definitions

Slip

When there is too little friction or traction between your feet (footwear) and the walking or working surface, and you lose your balance.



Friction: The resistance encountered when an object (foot) is moved in contact with another (ground). Friction is necessary in order to walk without slipping.



Fall

Occurs when you are too far off your center of balance.



Trip

When your foot (or lower leg) hits an object and your upper body continues moving, throwing you off balance.



or

When you step down unexpectedly to a lower surface (**Misstep**) and lose your balance, e.g., stepping off a curb.



Definitions

Two types of Falls:

- **Fall-at-the-same-level**

When you fall to the surface you are walking or standing on, or fall into or against objects at or above the surface.



- **Fall-to-lower-level**

When you fall to a level below the one on which you are walking, working, or standing.



For example:

- Step or stairs
- Ladder
- Platform
- Loading dock
- Equipment
- Etc.

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Causes of Slips

Some common causes of slips include the following:

- “wet” contamination/spills on smooth floors or surfaces: water, fluids, mud, grease, oil, food, etc.
- “dry” contamination making surfaces slippery: dusts, powders, granules, wood, lint, plastic wrapping, etc.



Water on floor of PVC pipe manufacturing plant



Wood dust and debris on shop floor

Causes of Slips



Transitioning from one type of flooring to another with less traction may cause a slip if one does not adjust for the change.

- highly polished floors, such as marble, terrazzo, or ceramic tile (can be extremely slippery even when dry)
- freshly waxed surfaces
- transitioning from one floor type to another (e.g., carpeted to vinyl/ smooth surface flooring)

Causes of Slips

- sloped walking surfaces
- loose, unanchored rugs or mats
- loose floorboards or tiles that can shift
- shoes with wet, muddy, greasy, or oily soles



Sloping driveway into the lower level of a garage, which had no safe designated pedestrian walkways

Causes of Slips



Metal has a lower force of friction/traction (i.e., is more slippery) than many other materials. Metal surfaces, such as dock boards, can become smooth and slippery with wear, and are extremely slick when wet, muddy, or greasy.

- ramps and gang planks without skid-/slip-resistant surfaces
- metal surfaces, such as dockboards and dock plates, platforms, construction plates or covers on sidewalks and roads, etc.

Causes of Slips

- mounting and dismounting trucks, tractors, heavy equipment, machinery, etc.; getting on and off trailers, truck beds



- climbing up and down ladders

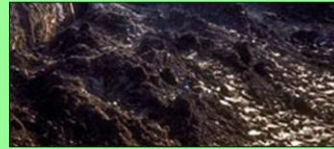
Metal rungs, steps, footholds, treads, running boards, platforms, etc. on equipment and ladders become even slicker when worn smooth and contaminated with water, mud, oil, grease, dirt, and debris.

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Causes of Slips



- loose irregular surfaces, such as gravel
- sloped or uneven terrain, sidewalks
- muddy terrain
- weather hazards: rain, sleet, ice, snow, hail, frost
- leaves, pine needles, plant debris (especially when wet)



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Causes of Trips and Missteps

Some common causes of trips include:

- uncovered cables, wires, or extension cords across aisles or pathways
- clutter, obstacles in aisles, walkways, and work areas
- open cabinet, file, or desk drawers and doors



In an emergency, you don't want any obstructions blocking your exit route and preventing your escape from danger.

Pathway to exit blocked



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Causes of Trips and Missteps

- changes in elevation or levels (e.g., unmarked steps, ramps)
- rumpled or rolled up carpets/mats, carpets with curled edges

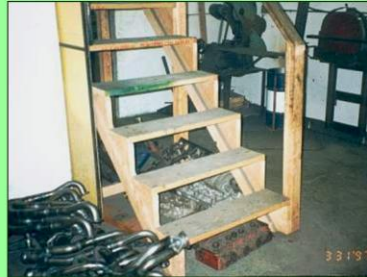


Threshold separating carpeting and vinyl flooring. Even a slight change in elevation can cause you to trip and fall.

- irregularities in walking surfaces (e.g., thresholds, gaps)
- missing or uneven floor tiles and bricks

Causes of Trips and Missteps

- damaged steps
- non-uniform, improper or irregular steps:
 - taller or shorter (varying rise)
 - shallower tread depth
 - otherwise irregular



Steep stairs (52-degree slope) with tall steps. Note that it is also missing a handrail on the left and a mid-rail on the existing one.

Over 2.5 million falls on stairways result in about 2 million disabling injuries yearly.

Causes of Trips and Missteps



Building materials, hoses, debris clutter the pathway. A trip here will likely result in falling on something that will cause further injury.

- debris, accumulated waste materials
- trailing cables, pallets, tools, etc. in gangways
- objects protruding from walking surface
- uneven surfaces
- sidewalk/curb drops

Slightly sloping, uneven sidewalk and adjoining parking lot entrance with deep cracks, gaps



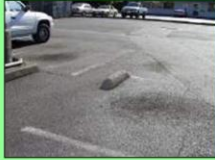
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Causes of Trips and Missteps

Trips and falls also occur in parking lots and garages when you travel through parking areas and enter your workplace or other sites during business travel.



Speed bump



Tire bumper



Wheelchair accessible curb

Be careful also of slippery conditions in the parking lot due to rain, ice, snow, frost, sleet, and hail.

Unmarked elevation changes:

- speed bumps
- tire bumpers (wheel stops)
- wheelchair accessible curbs, ramps
- driveways

Conditions Increasing the Risk of Slips And Trips

Conditions and situations that make it difficult to see potential hazards or that distract your attention can contribute toward a slip or trip.

Can you see the worker on the stairs?



- poor lighting
- glare
- shadows

- bulky or awkward personal protective equipment (PPE)
- excess noise, temperature



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Human Factors Increasing the Risk of Slips And Trips

Physical Condition

Health and physical condition can impair a person's vision, judgment, and balance.

- Eyesight, visual perception
- Age
- Physical state, fatigue
- Stress, illness
- Medications, alcohol, drug effects



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Human Factors Increasing the Risk of Slips And Trips

Human Behavior

Behaviors – actions you choose and control (e.g., working safely) – can contribute to a slip, trip, and fall injury if you set yourself up for one.



- Carrying or moving cumbersome objects, or too many objects, that
 - obstruct your view
 - impair your balance
 - prevent you from holding onto handrails

Human Factors Increasing the Risk of Slips And Trips

- Inattentive walking, distractions (e.g., using cell phone, talking and not watching where you're going, etc.)
- Taking shortcuts; not using walkways or designated, cleared pathways
- Being in a hurry, rushing around



Human Factors Increasing the Risk of Slips And Trips



Messy work space



Water leakage from ice machines not mopped up; no wet floor warning signs

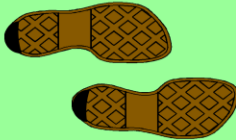
- Poor housekeeping (allowing clutter to accumulate, not maintaining clean dry floors, etc.)
- Using improper cleaning methods (e.g., incorrectly using wax or polish; or trying to clean up grease spill with water)
- Not using signage when slip or trip hazards exist

Human Factors Increasing the Risk of Slips And Trips

Footwear

- Wearing improper footwear not suitable for the environment

(Reduced traction)



Taps on heels



Leather or smooth-surfaced soles



High heels

Slips, Trips, and Falls Are Preventable!

Ways to prevent slips, trips, and falls:

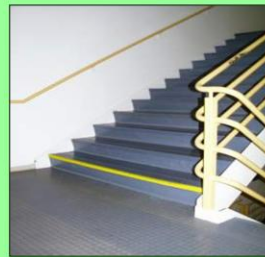
- Design the workplace and work processes to prevent potential exposures to slip and trip hazards.
Consider using cordless tools when possible.
- Maintain clear, tidy work areas free of clutter; follow good housekeeping procedures.
- Follow safe walking practices.
- Wear proper footwear with good traction.

Workplace/Work Process Design



Step edges are highlighted for better visibility to prevent a misstep and fall down the stairs.

Mark/highlight step edges and transition areas (changes in elevations). Use anti-skid paint.



Confusing the bottom step with the floor is a common occurrence when it's not marked. No missing the last step here. Make sure stairs have sufficient lighting and hand rails.

Maintaining Work Areas: Housekeeping

- Keep floors clean and free of water, mud, grease, debris, etc, and damage.
- Clean spills immediately. Mop or sweep up any debris.
- Repair any damages immediately, or replace if necessary.
- Cone or block off area until surface is completely dry or repaired before allowing people to walk through the area.

Maintaining Work Areas: Housekeeping

- Clean surfaces according to recommended schedules. Follow cleaning and drying methods and procedures, using appropriate cleaning products. Use an adequate number of highly visible wet floor signs or cones.



- Remove signs and cones when area is dry.

Safe Walking Practices

- Check that your pathway is clear and your view is not blocked before you lift anything.
- Don't carry a load you can't see over or around. Use a cart. Carry small loads close to your body.
- When going to another floor/level, take the elevator if you are carrying a load requiring both hands.
- Report any missing or broken stair rails and slippery or damaged flooring, loose or deteriorating carpeting. Repair or report floor problems, such as missing tiles, etc.



Safe Walking Practices



- Walk carefully and slowly when you transition from one type of walking surface to another. Adjust your walking (pace, stride).
- Take extra care when you come indoors with wet shoes or boots.
- Slow down and take small careful steps if the surface is uneven, cluttered, slippery or at an angle.
- Wear stable shoes with non-slip soles.

Safe Walking Practices

If you must walk on a slippery or wet surface, do the following:

- Wear high traction footwear
- Take short, slow steps
- Point your feet slightly outward to keep your center of balance under you
- Pay attention to the surface you are walking on
- Use rails or other stable objects you can hold onto

Mounting/Dismounting Equipment Safely

- Clean footwear of mud, snow, ice, grease, or any other contamination.
- Make sure running board, tread, step, foothold, and platform of equipment are also clean and dry of any contamination.
- Always face equipment when mounting and dismounting.
- Have a good hand-hold before stepping up.
- Place your foot on the step or foothold just in front of your heel, under the arch.



Clean shoes
Clean foothold and step
Proper foot placement on step
and foothold

Mounting/Dismounting Equipment Safely

- Maintain three-point contact at all times while getting onto/off of the equipment until reaching ground, cab, or stable platform.
- Three point contact:
 - » One hand & two feet or
 - » Two hands and one foot
- Do not jump off when dismounting or getting off the bed of a truck or other part of the equipment. Step down carefully while facing equipment (reverse order of the pictures below).



Courtesy of Construction Safety Association of Ontario

Wearing Proper Shoes

Wearing proper shoes can help prevent or reduce the risk of a slip, trip, and fall incident.

- Footwear should fit snugly and comfortably.
- Wear slip-resistant shoes/boots with good tread.
- Keep your footwear clean and in good condition at all times.
- Inspect regularly for any damage; repair or replace worn or defective footwear.

*Replace shoes or soles before soles become worn smooth

- *Don't wear shoes with:*
- *Leather or smooth-surfaced soles*
- *Spiked/high heels*
- *Taps on heels*



Wearing Proper Shoes

Wear shoes with slip-resistant soles or traction devices when walking or working on surfaces that are wet, greasy, icy, or otherwise slick (e.g., in kitchen areas, performing custodial work).

No footwear has anti-slip properties for every condition so make sure that the proper type of footwear is selected for the work conditions and for the type of flooring or walking/working surface

Slip-resistant traction devices for snow and ice that fit over the soles



Steel-toed safety boots with oil-resistant soles



Falling 'Properly'

If you do fall, you can reduce the chance of serious injury if you:

- Roll with the fall; don't reach out. Let your body crumple and roll.
- Bend your elbows and knees and use your legs and arms to absorb the fall.
- Get medical attention after a fall to treat anything torn, sprained, or broken.

*Thank you for taking the time to
learn about safety and health and
how to prevent future injuries and
illnesses.*